Memphis Depot

Dunn Field
Early Remedy Implementation

Presented By:

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Memphis Depot Restoration Advisory Board Meeting

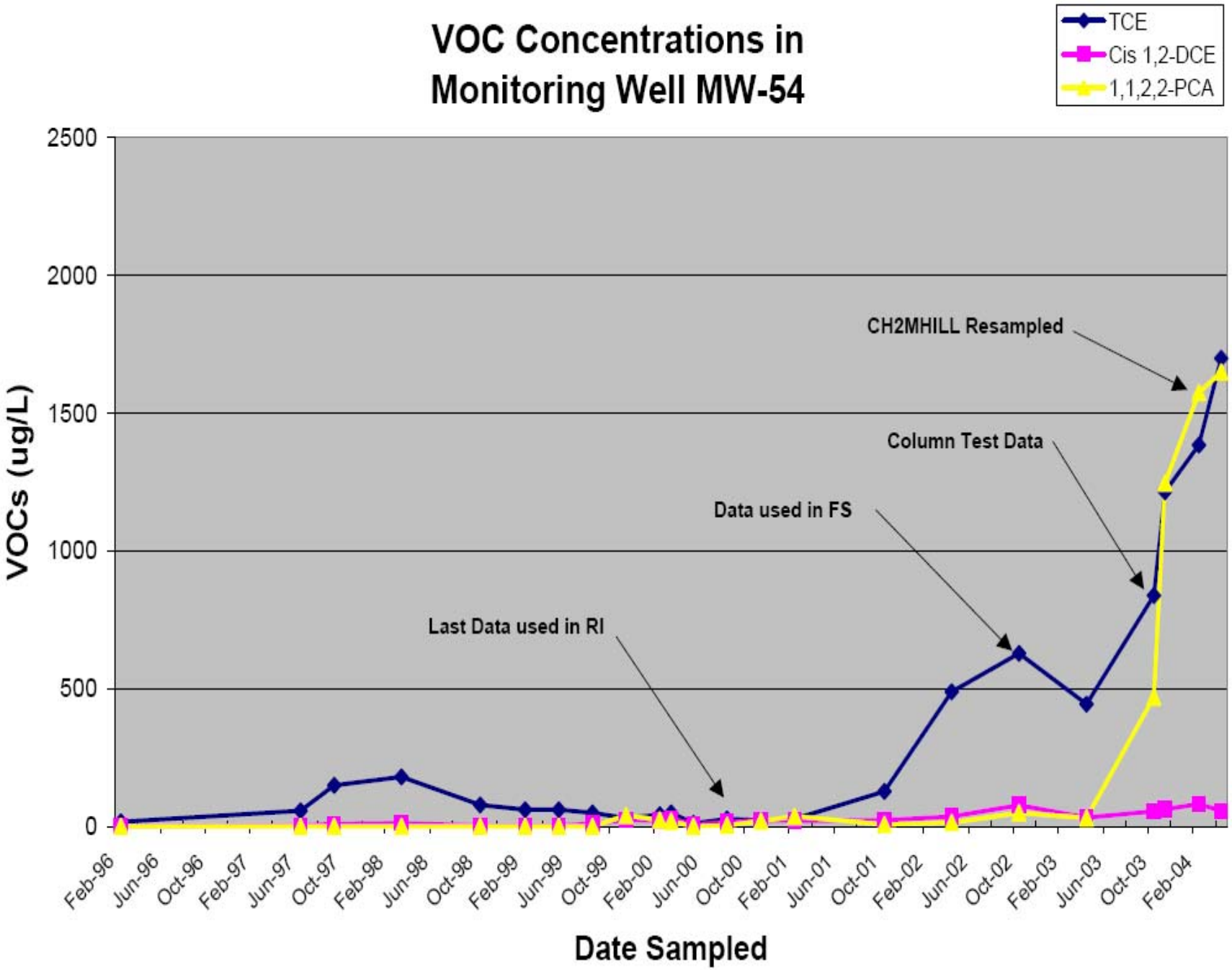
October 21, 2004

U.S. Army Engineering and Support Center, Huntsville

CH2MHILL

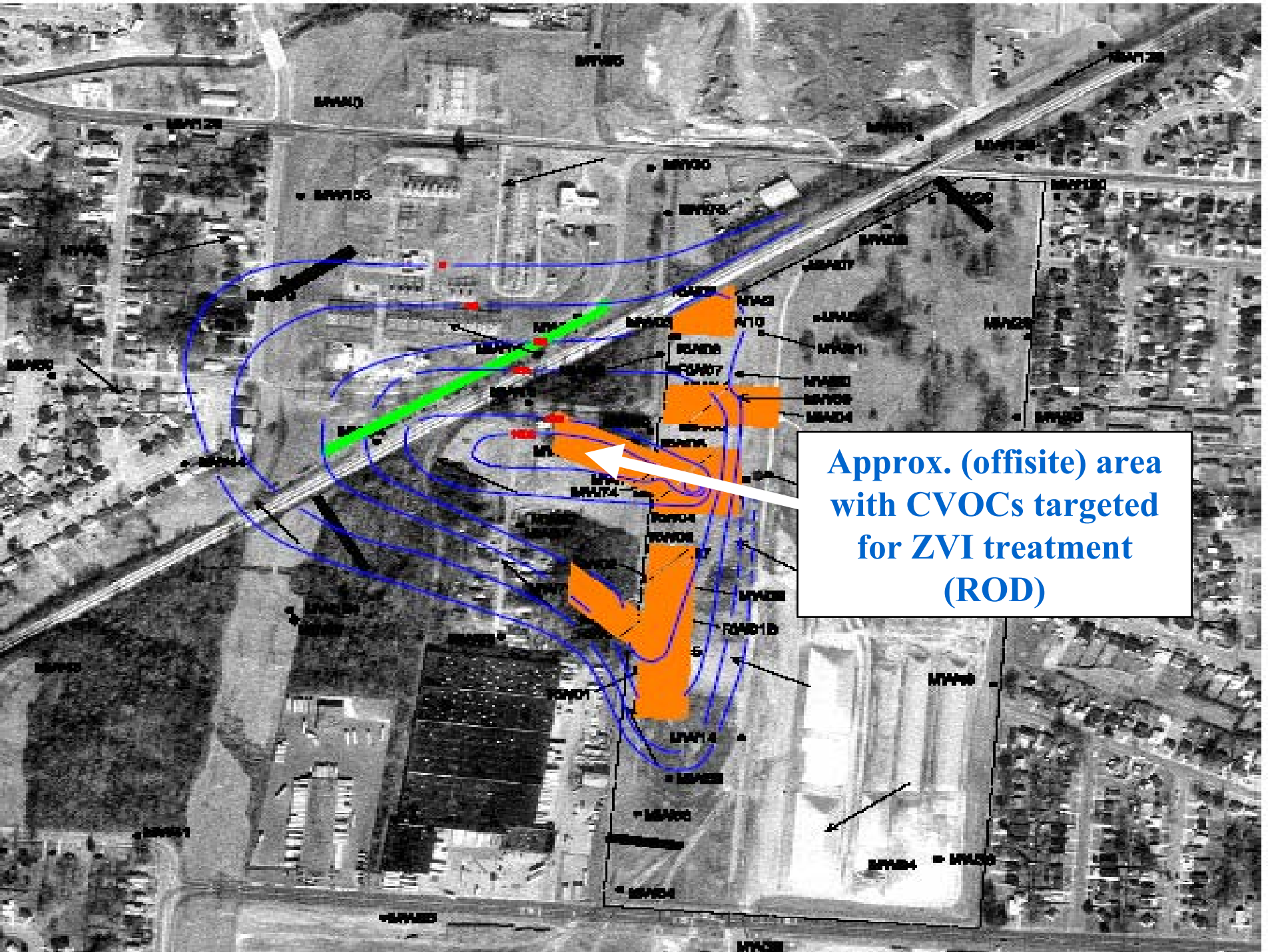
Early Remedy Implementation

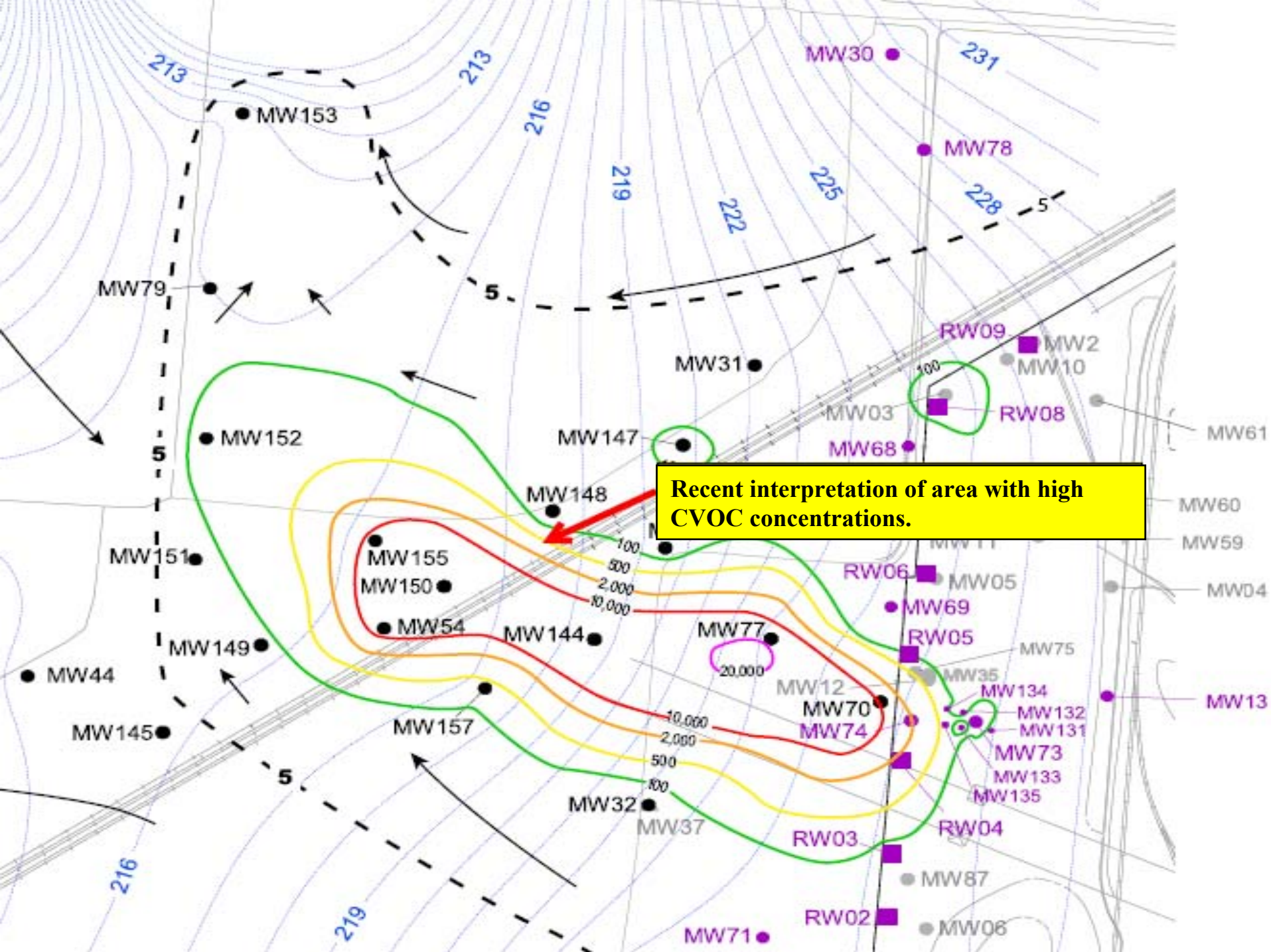
- The Final Dunn Field Record of Decision (ROD) approved in April 2004
  - Excavation and offsite disposal of affected soil and debris from disposal sites
  - Soil Vapor Extraction (SVE) of soil containing solvents
  - Institutional Controls for surface soil on west side of Dunn Field
  - Zero-Valent Iron (ZVI) injection, Permeable Reactive Barrier (PRB), and Monitored Natural Attenuation (MNA) with Institutional Controls for groundwater
- Data collected in 2003/2004 as part of the Remedial Design (RD) revealed rise in levels of Chlorinated Volatile Organic Compounds (CVOCs) in area west of Dunn Field


VOC Concentrations in Monitoring Well MW-54
TCE
Cis 1,2-DCE
1,1,2,2-PCA
2500
2000
1500
1000
500
0
VOCs (ug/L)
CH2MHILL Resampled
Column Test Data
Data used in FS
Last Data used in RI
Feb-96
Jun-96
Oct-96
Feb-97
Jun-97
Oct-97
Feb-98
Jun-98
Oct-98
Feb-99
Jun-99
Oct-99
Feb-00
Jun-00
Oct-00
Feb-01
Jun-01
Oct-01
Feb-02
Jun-02
Oct-02
Feb-03
Jun-03
Oct-03
Feb-04
Date Sampled

Early Remedy Implementation

- Additional groundwater monitoring wells installed May-August 2004
  - Objective: Define boundary of affected groundwater that has moved offsite from Dunn Field
- Data collected from new and existing wells showed higher CVOC concentrations further west than previously thought at the time of the ROD


Approx. (offisite) area with CVOCs targeted for ZVI treatment (ROD)


MW30
231
MW153
213
213
216
MW78
219
225
222
228
5
MW79
5
RW09
MW2
MW10
MW31
100
MW03
RW08
MW61
MW68
MW152
MW147
MW148
Recent interpretation of area with high CVOC concentrations.
MW60
MW59
MW151
MW155
MW150
100
500
2,000
10,000
RW06
MW05
MW04
MW69
MW54
MW144
MW77
RW05
MW75
MW149
20,000
MW35
MW12
MW134
MW13
MW44
MW70
MW132
MW74
MW131
MW145
MW157
10,000
2,000
500
100
MW73
MW133
MW135
MW32
MW37
RW04
RW03
MW87
216
219
RW02
MW71
MW06

Early Remedy Implementation

- The BRAC Cleanup Team (BCT) decided to begin early implementation of Zero-Valent Iron (ZVI) injection
  - To reduce concentrations of CVOCs and create conditions more favorable for the success of the overall groundwater remedy
    - MNA
    - PRB

Early Remedy Implementation

- ZVI will be injected at leading boundary of the offsite groundwater impacts
  - Pure iron metal granules or powder
  - Reduces concentration of CVOCs through a chemical reaction
- In-situ Chemical Reduction Treatability Study at Dunn Field revealed significant, rapid reduction of CVOCs in groundwater after ZVI injection

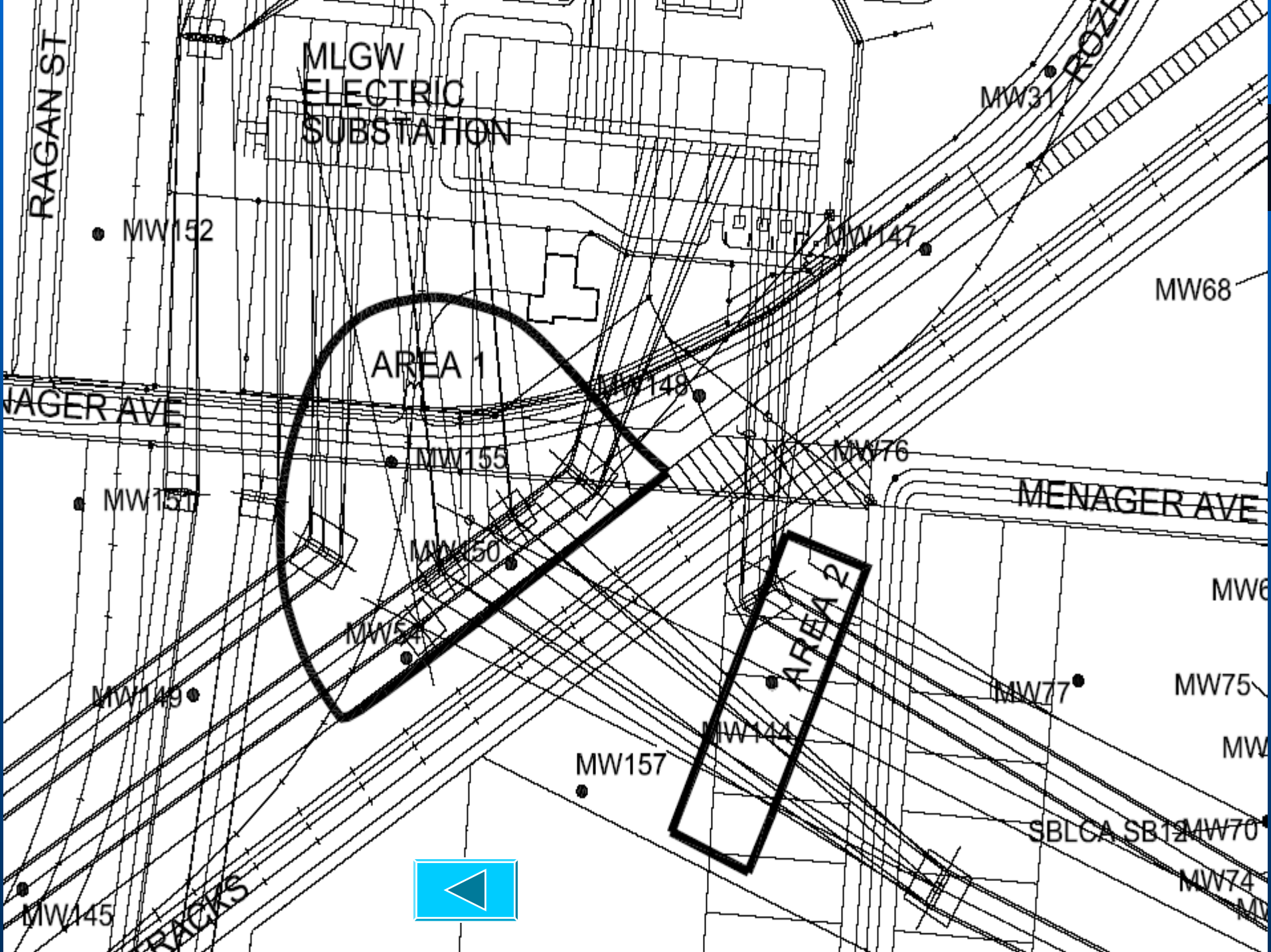
Early Remedy Implementation

- ZVI injection will be implemented in primary and secondary treatment areas

Area Map

- The early remedy implementation field effort will include three main activities:
  - Installation of additional monitoring wells
  - Installation of ZVI injection points and injection of the ZVI into the fluvial aquifer 80-100 feet below the surface
  - Monitoring of groundwater prior to and subsequent to the injection

Next slide

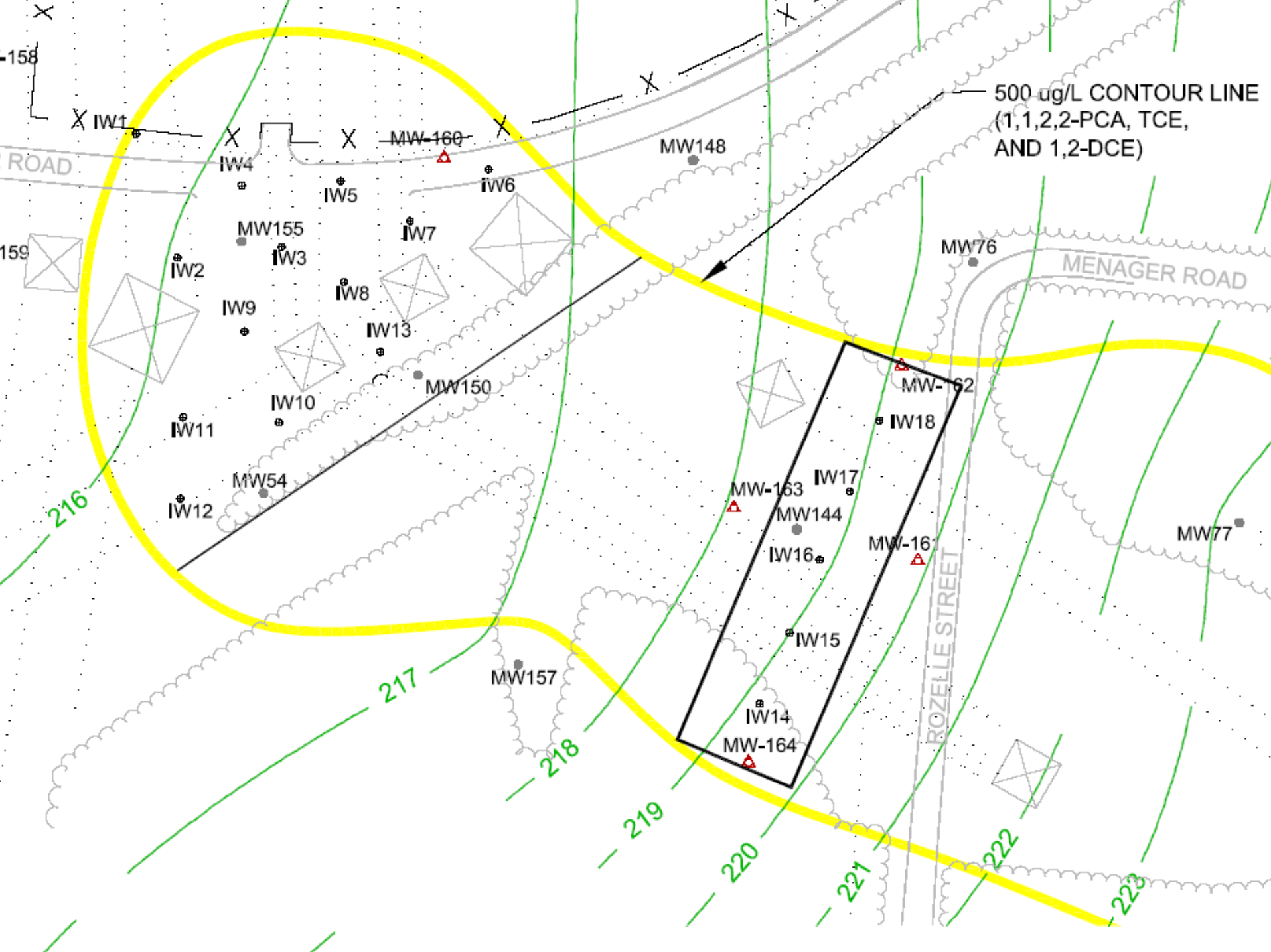

MLGW
ELECTRIC
SUBSTATION
RAGAN ST
MW152
MW31
MW147
MW68
AREA 1
MW149
MW155
MW151
MW76
MENAGER AVE
MW150
MW154
AREA 2
MW77
MW75
MW144
MW157
SBLCA SB12
MW70
MW74
MW145
MW149

Early Remedy Implementation

- **Installation of additional monitoring wells:**
  - Approximately eight new monitoring wells installed at seven locations up gradient and downgradient to the ZVI injection areas
    - completed October 2004
  - Define the boundary for the early implementation areas
  - Confirm reduction in CVOC levels
    - through post-injection monitoring

Early Remedy Implementation

- **Installation of ZVI injection points and injection of the ZVI into the shallow aquifer:**
  - **Approximately 18 injection points and 175,000 pounds of ZVI to be injected (work expected to begin in November 2004)**
  - **Approximately 30 days to accomplish effort**
  - **Involves use of drill rig, injection equipment, and support vehicles**


500 ug/L CONTOUR LINE
(1,1,2,2-PCA, TCE,
AND 1,2-DCE)
MW-160
MW148
IW1
IW4
IW5
IW6
IW7
MW155
IW3
IW2
IW8
IW9
IW13
MW150
IW10
IW11
MW54
IW12
MW76
MENAGER ROAD
MW-162
IW18
IW17
MW-163
MW144
IW16
MW-161
MW77
IW15
ROZELLE STREET
MW157
IW14
MW-164
216
217
218
219
220
221
222
223

Early Remedy Implementation

- **Early Implementation results will be:**
  - **Reported to BCT**
  - **Included in a Technical Memorandum as part of Dunn Field RD**
  - **Presented to RAB/community (EnviroNews, RAB meeting)**

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